American Journal of Pharmacy

AND THE SCIENCES SUPPORTING PUBLIC HEALTH

BOTANIC MEDICINE STORE,

By Dr. H. Winchester & Co.

Rear of 49, Hanover Street...BOSTON.—Entrance at the Iron Gate.

The Senior Proprietor of the above Establishment having been long engaged in the trade of BOTANIC MEDICINES, as well as using them, for the benefit of the sick, and knowing their superior worth, as well as the great importance of establishing a GENERAL FINDING STORE in this city, for the benefit of all classes of Botanic Physicians, as also for the accommodation of Private Families, who are in almost daily use of Roots, Herbs and Barks.

The proprietors have located themselves as above, where they devote their whole time in preparing VEGETABLE MEDICINES, and collecting Indigenious Plants from all parts of the United States. Grateful for past favors they solicit a continuance of the public patronage. Orders from Druggists in this and distant cities, and from Country Physicians will be promptly attended to. Prices at wholesale will be governed by the Shaker's Standing List, in most cases—from which a liberal discount will be made for cash.

The following is a catalogue of simples kept on hand when practicable:

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" " Tag
" " Buds
Angelica Herb
" Root
Avens Root
American Gentian
Balm Sweet
" Lemon
Balm Gilead Buds
Bayberry bark.
Barberry "
Bethroot
Bittersweet
Blackberry Root
Blood "
Blue Scul-cap
Buckbean plant
Buck-thorn, Maldera
Bugle, sweet
" bitter
Burdock leaves
" root
" seed
Box wood
Blessed Thistle
Blue Flag-root
Birch bark
Cancer-root, plant
Catnip, herb
Celandine, garden
" wild
Chamomile Flowers
" low
Cleavers, or Clivers
Cramp bark
Coho-root, herb

Comfrey root
Cow-parsnip root
Cranesbill root
Creeping Wintergreen
Cayenne, Pure African
" " in pods
or fine powder
Cohosh, or black root
[illegible], herb
Cinnamon
Cloves
Dandelion plant
" root
Dragon root
Daisy flowers, white
" root
Dulse
Elder flowers
" berries
" bark
" root, dwarf
Elecampane root
Feverfew, herb
Flax seed
Fleabane
Foxglove
Frostwort
Gargat, or Skoke
Goldenrod, sweet
Goldthread root
Golden-seal
Gravel root
Ground Ivy
Ginseng root
Ginger
Gums of various sorts
Hardhack leaves

Hemlock bark
" gum
Hollyhock flowers
Horehound, herb
Horse Radish Leaves
Hyssop, herb
Henbit
Hops by the bale
Iceland Moss
Indian Hemp root
Jerusalem Oak
Johnswort
Jacobs Ladder
Laurel
Life-everlasting
Lily root, white
" " yellow
Lobelia, herb
" seed
Lovage, herb
" root
Lungwort
Maidenhair
Mandrake root
Mallows, Marsh
" root
" low
Marsh Rosemary
Mayweed
Moccasin or Nerve root
Motherwort
Mountain Ash bark
Mountain Mint
Meadow "
Mugwort
Mullein leaves
" flowers and seeds

[illegible] root
Myrrh, best
Noble Liverwort
Nettle root
Parsley herb
" root
Peppermint
Plantain leaves
Pleurisy root
Poplar bark
Prickley Ash bark
" berries
Pennyroyal
Poke root
Raspberry leaves
Rue herb
Saffron
Sage
Sanicle
Sarsaparilla
Sassafras bark
Savin
Scabish
Silkweed root
Skunk Cabbage root
Slippery Elm bark
Snake-root Canada
" Button
" Virginia
Snake-head, or Balmony
Solomon-seal root
Southern wood
Spearmint
Spice, or Fever bush
Spikenard root
Sumac leaves
" berries

Sumac bark of root
Summer Savory
Sweet Marjoram
Sweet Fern
" " root
Sweet Flag
Sweet Root
Savory "
Spice of all kinds
Tansy Double
Thorn-apple leaves
" root
Thoroughwort
Thyme
Tooth-ache bark
Tamarack bark
Uva Ursi or Mountain Cranberry
Unicorn root
Vervain herb
Water Pepper or Smart Weed
White Hellebore
White Oak bark
White Pine "
Whitewood "
Wild Indigo root
Wintergreen pipsis
Witch-hazel leaves
" bark
Wormwood herb
Wormseed
Yarrow
Yellow Dock
Yellow Parilla
☞ The most of the Roots and Barks are pulverized.

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This is an excellent article in removing dyspeptic affections, and giving tone to the stomach.

Jaundice Bitters.

An excellent regulator of the Bile and bowels.

Anti-Mercurial, or Purifying Syrup.

This is a first rate article to cleanse the system from the mercury taken otherwise.

Rheumatic Liniment

For external use of every kind.

Cough Specific,

Or Pulmonary Balsamic Syrup of Liverwort, for Coughs and Consumption.

Mother's Cordial.

Female Strengthening Syrup.

Hull's Celebrated Bilious Physic.

Dysentery Cordial.

Oils and Extracts.

N. B. Howard's Improved System of Botanic Medicine—Smith's, Brown's, and Priest's, with several other kinds of medical works, on the Improved or Thompsonian System. Also, Syringes, Bottles, Phials, and fine Box Seives. Cherry Spirits and Alcohol, together with many compounds not here mentioned.

CENTURY OLD BOTANICALS

Since 1825 *September 1945*

American Journal of Pharmacy

Published monthly by the Philadelphia College of Pharmacy and Science
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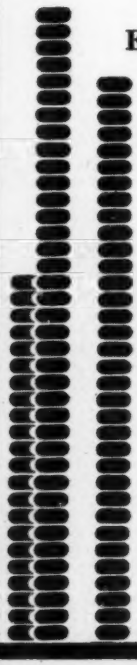

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1. KEARNS, W. M.: WISCONSIN, M. J. *41*:575, 1942.
2. SOULE, S. D.: AM. J. OBST. & GYNEC. *45*:315, 1943.
3. ALLEN, W. M.: SOUTH. M. J. *37*:270, 1944.
4. HARDING, F. E.: AM. J. OBST. & GYNEC. *48*:181, 1944.

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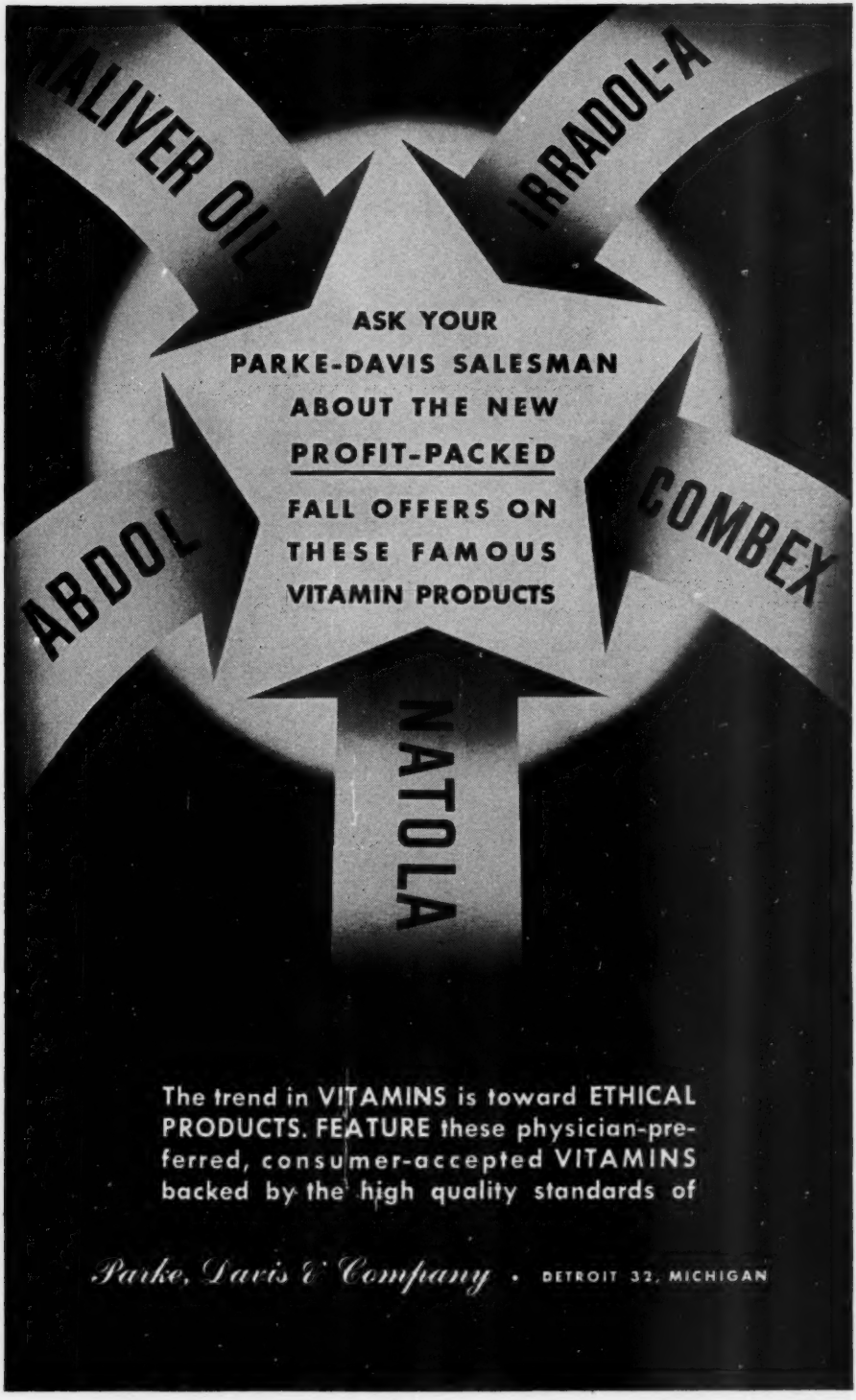
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The trend in VITAMINS is toward ETHICAL PRODUCTS. FEATURE these physician-preferred, consumer-accepted VITAMINS backed by the high quality standards of
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AMERICAN JOURNAL OF PHARMACY

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Since 1825

Vol. 117. SEPTEMBER, 1945 No. 9

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EDITORIAL

THE DANGERS OF INADEQUATELY TRAINED PERSONNEL

FOR a number of years most of the better pharmaceutical companies have refrained from employing professional representatives unless they were graduates of a recognized college of pharmacy. The adoption of this policy was based upon the realization that only college trained men and women could be expected to discuss physiology, pharmacology, chemistry and the other sciences on an intelligent basis with the physicians and pharmacists whom they were required to contact. It is true, of course, that each company gives to its personnel, who are assigned to such work, an intensive training program, but without the proper collegiate background the veneer of understanding that they acquire is thin indeed. There is also the constant threat that some physician, upon whom the representative is calling, may decide to discuss some problem or product totally unrelated to the subjects discussed in the training program. An ignorant or evasive statement at such times can easily destroy all confidence in past or future descriptions of new therapeutic trends and products. The only safe plan is to have the representative sufficiently well grounded in the underlying sciences that he can stand on his own in such instances and acquit himself in a creditable manner. This can only be assured when the individual has acquired the well rounded educational background presented today in our various colleges of pharmacy.

It is with deep misgivings that we learn of a few companies who now are so sorely in need of professional representatives that they are contacting various separation centers and hiring on the spot discharged veterans who have only the very narrow training and experience obtained as a so-called pharmacist's mate in the Navy or as a corpsman in the Army. On the surface this would appear a perfectly reasonable program since the need for men is so great and the need of the veteran for a job seems to provide the ideal solution. But is it? These men can, of course, be given the bare essentials concerning the

products that they are supposed to present and discuss with other better educated professional men, but sooner or later they will find themselves trying to do their assigned task in competition with others who do possess a collegiate background. Will these same companies then be content with an inferior man and a lack of sales progress, which is of their own making, or will they then feel constrained to replace the now unwanted individual with one properly educated?

In our opinion it is far better to advise men who are motivated toward the field of pharmacy to obtain a basic pharmaceutical education now readily obtainable through governmental aid. Upon the completion of college these men will then not find themselves in an inferior position from the standpoint of qualifications. This in the long run is the only safe plan. Pharmacy, too, has an interest in these developments since it is a well-established fact that company representatives play an important role in promoting the profession and its prestige in medical circles. To place untrained men in such positions of importance is damaging to our interests to say the least.

In all our relations with the returning serviceman it would be wise to act and advise him in that manner calculated to benefit him most, considering his problems and future as a long-term proposition. The immediate gratification of his desires either through a sincere feeling of indebtedness or a failure to look ahead can only lead to his eventual dissatisfaction and disillusionment.

L. F. Tice.

CENTURY OLD BOTANICALS

By George N. Malpass, Ph. C.*

THOSE of us who aspire to fame as collectors of old stamps and letters are occasionally rather pleasantly surprised to run across specimens of historic or scientific interest.

Recently it was my good fortune to acquire a folded letter sent from a prominent botanical drug house located in Boston, to a drug importing firm in New York. The letter is 11 by 18 inches and is folded once, forming two complete sheets. One sheet was used for writing the message, while the other contained a full page advertisement of the stock for sale. The entire double sheet was then folded over to constitute an envelope, sealed with wax, and despatched by the post.

The letter itself is dated September 28, 1840, and bears no stamp, since the first governmental adhesive postage stamps were not issued until seven years later. Prior to 1847 letters were either prepaid when despatched or the fee was collected on delivery. Since there is no Boston postmark on this folded envelope, and no evidence of a fee having been prepaid, we can assume that collection was made on the arrival of the letter at its destination. The New York hand-stamped postmark appears twice and a large penned check mark was placed within one of these circular hand-stamps, probably denoting payment of the fee. The New York date of receipt is October 1st, or three days after the letter was written. This was fairly rapid delivery time for a century ago.

The actual letter is a statement of account and reads exactly as follows:

H. Winchester & Company
Boston, September 28, 1840

Messrs. Seth Low & Company

Gents We received your sample Rose leaves this morning Think they will answer Will take them at 35¢ per lb. and if the Bombay Myrrh is equal to the box we bought of you last fall at 45¢ we will take one Box as small as you can select at 45¢ 6 month ————

---

* Research Director, R. J. Strasenburgh Co.

In regard to your bill charging us a ballance, we think you are in error You will find your last bill was made up by charging 1.50 cents for collecting draft at the same time giving us credit for the net amount only as we recon it stands in our favor

(Then follows a cash statement of account in which the balance is 70¢ in favor of Dr. Winchester. He then adds, "by Sample Gum Myrrh 70¢ Call it square".)

As above you see that we have charged you the full amount of draft and credited you 1.50 for collecting this. You will find us right and the excess over was for Gum Myrrh you sent us as a sample

With due respect
H. Winchester & Company

Most interesting of all is the list of drugs shown on the illustrated advertising page. After an institutional "build-up" of several paragraphs, the "simples" which were kept in stock are listed in alphabetical order. There are 154 individual drugs, and this can be considered a good cross-section of the entire materia medica *in actual use* at the time.

The writer is one of those who are old-fashioned (or far-sighted) enough to believe that many of the old-time vegetable drugs did possess definite, but in some instances intangible, therapeutic value.

It is interesting to trace the development or decline in the usage of these botanicals during the succeeding century.

At the time this advertisement was in use (1840) the first decennial revision (1831) of the U. S. P. was official. The second revision did not make its appearance until 1842. Botanical drugs were at that time divided into two groups. The first were those which were recognized by and described in the U. S. P. There was also a *Catalogus Secundarius* or secondary list, which performed a service now rendered by the National Formulary. It was a list of "simples" not described in the U. S. P. but of sufficient interest, or so generally used, as to warrant some attention. The exact function of this list was defined in the 1831 revision of the U. S. P. as follows:

"The possession of a supplementary catalogue or secondary list of medicines is a peculiarity of the old Pharmacopoeia which,

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Cudweed, herb
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This is a fine [illegible] article to cleanse the system from any [illegible] whatever.

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as it appears to have had its origin in just views, and is certainly very convenient, has been retained in the present. Its chief advantage is, that it keeps in the view of the profession numerous medicinal substances, which, though their reputation is not sufficiently general to entitle them to rank with the standard remedies, are nevertheless not altogether unworthy of notice. Such a catalogue may be considered a place of probation, in which newly proposed remedies may be introduced and remain till experience shall have established their claims to a higher station, or have proved them utterly worthless; and to which remedies, which

> have been in general use but have lost their credit, may be consigned to await the judgment of the profession, when the influence of fashion may be no longer exerted against them."

Many of the drugs listed have passed from active use, while others yet remain with us, especially as ingredients of the various "species" or teas listed in the *Pharmaceutical Recipe Book*.

It is possible that many of the "century old" botanicals contain some active principle not yet isolated, or perhaps pharmacological action not yet recognized. A good example is the lowly burdock. A century ago all parts of this plant were used for their healing properties—leaves, root and seed. Gradually its usage declined, until it is but rarely prescribed today. During the past year burdock has been found to contain an antibiotic substance of low toxicity. Did our forefathers know more than we do about drug action? Certainly they obtained results, even without being able to explain fully the nature of the drug action.

With modern improved methods of extraction and concentration, and advanced techniques for pharmacological evaluation, vegetable drugs undergoing a re-investigation may be expected to produce some surprising results.

In order to make a comparison of the trend in botanical medication and to stimulate interest in some of the "century old" drugs, a tabulation of each "simple" listed as stocked in the 1840 botanical drug house has been made. Identification of individual items was in some instances a difficult task, since a number of the drugs were assigned synonyms commonly used a century ago, but which have entirely passed out of use. With the aid of the *U. S. P., U. S. Dispensatory, Griffith's Medical Botany* and other "century old" works, the writer was able to identify with reasonable certainty all but eight species. Professor Edmund H. MacLaughlin and Mr. John E. Kramer, both of the Philadelphia College of Pharmacy and Science, kindly assisted in establishing the identity of those remaining. The tabulation, with a brief description of each drug, is as follows:

Name of Plant (1840)	Identity	Status 1840	Status 1945	Notes
Alder Bark Black (tag, buds)	Prinos	Sec.*	.....	(See also Spice Bush.) In U. S. P. 1880, but later dropped. Used for diarrhea and later for skin lesions.
Angelica (herb, root)	Angelica	Sec.	.....	Official in N. F. *V.* as fruit and root. Diuretic, counterirritant.
Avens (root)	Geum	.....	.....	Formerly used in Europe for dysentery and fever.
American Gentian	Gentiana Catesbaei	.....	.....	At one time in U. S. P. secondary list. Only *G. Lutea* is now official.
Balm (sweet, lemon)	Melissa	.....	.....	Both "sweet" and "lemon" used as synonyms. Was official in U. S. P. 1890.
Balm of Gilead Buds	Populi Gemma	.....	N. F.	Not of sufficient importance for listing in 1840, but now official.
Bayberry Bark	Myrica	.....	.....	Official in N. F. *V.*, but subsequently dropped. Stimulant and astringent.
Bayberry Bark	Berberis	.....	N. F.	Only Rhizome and roots official today. What is meant by "bark" is the root bark.
Bethroot	Trillium	.....	N. F.	Rhizome and roots official, but not extensively used.
Bittersweet	Dulcamara	U. S. P.	.....	Official in N. F. *V.*, but subsequently omitted. For rheumatism, bronchitis, etc.

* Drugs described in the *Catalogus Secondarius* (1831) will be designated "Sec."

Name of Plant (1840)	Identity	Status 1840	Status 1945	Notes
Blackberry Root	Rubus	Sec.	.....	Rhizome and roots official in N. F. *V*. In 1831 *R. Villosus* or dewberry was described.
Blood Root	Sanguinaria	U. S. P.	N. F.	Dried rhizome, still occasionally used.
Blue Scul-cap	Scutellaria	.....	N. F.	Although still official in N. F., the U. S. Disp. states that it is without medical value.
Buckbean Plant	Menyanthes	Sec.	.....	Leaves official in N. F. *IV*.
Buck-horn (male-fern)	Royal Fern	.....	.....	Rhizome of *Osmunda regalis* (*L.*). Formerly used as a tonic, astringent and demulcent.
Bugle-Sweet	Lycopus	Sec.	.....	U. S. P. 1870. Also "buglewort" and other synonyms. Mild narcotic and astringent.
Bugle-Bitter	Ajuga	.....	.....	Also called "mountain bugle" and indigenous to Europe. Used for amenorrhea and rheumatism.
Burdock (leaves, root, seed)	Lappa	.....	N. F.	(See also "Cuckold".) The first year root is official in N. F. Fresh leaves were at one time used both externally and internally in cutaneous eruptions and ulcerations.
Box Wood	Buxus	.....	.....	The wood and leaves have both been used for rheumatism, fever, nephritis, etc.
Blessed Thistle	Cnicus (benedictus)	.....	.....	One of several thistles used as diaphoretic, tonic, emetic.
Blue Flag-root	Iris Versicolor	Sec.	N. F.	Florentine iris was official in the U. S. P. 1831 and is now in the N. F. Blue flag has about the same status.

Name of Plant (1840)	Identity	Status 1840	Status 1945	Notes
Birch bark	Betula	.....	.....	*Betula alba,* or canoe birch, had some medicinal use, but probably *B. lenta* or sweet birch is meant. It was in popular use as a source of wintergreen oil.
Cancer-root (plant)	Epifagus	.....	.....	A parasitic plant growing upon the roots of the beech tree. Folk legend dictated that it be used as a local application for cancerous ulcers, hence the name.
Catnip, herb	Cataria	.....	N. F.	Dried leaves and flowering tops used.
Celandine (garden and wild)	Chelidonium	.....	.....	Official in U. S. P. 1890, described as growing wild. Apparently it was also cultivated. It is an irritant purgative and the juice has been used locally upon warts, corns, and other skin abnormalities.
Chamomile (flowers)	Matricaria	.....	N. F.	Hungarian or German chamomile. Dried flowers, heads only.
Chamomile (low)	Anthemis	U. S. P.	.....	This might mean the lower parts of the plant, or the lower bush Anthemis (Roman Chamomile). Probably this is the case, as it was in common use in 1840. Not only the tops, but the whole herb was used.
Cleavers, or Clivers	Galium	.....	.....	Juice of *Galium Aparine* (*L.*) was at one time used as an aperient, diuretic and anti-scorbutic.
Cramp-bark	Viburnum Opulus	.....	N. F.	American cranberry bush. Still extensively used.
Coltsfoot (herb)	Farfara	.....	.....	Leaves official in N. F. *V.*

Name of Plant (1840)	Identity	Status 1840	Status 1945	Notes
Comfrey Root	Symphytum	.....	.....	Contains a mucilaginous principle and was used as a demulcent. Also used for catarrhs and consumption.
Cow Parsnip Root	Heracleum	.....	.....	Rubifacient when applied to the skin. Used as a stimulant and carminative.
Cranesbill root	Geranium	U. S. P.	.....	Official in N. F. *V.*, but now deleted.
Creeping Wintergreen	Gaultheria	.....	.....	*Gaultheria procumbens.* Leaves, stems and rhizome used. Formerly official in U. S. P. The berries were official in 1831.
Cayenne, pure African (ditto, in pods or in fine powder)	Capsicum	U. S. P.	N. F.	Still widely used. Various species from several sources.
Culvers, or black root	Leptandra	.....	N. F.	Actually the root is brown, but the synonym "black root" is commonly used.
Cuckold, herb	Lappa	.....	N. F.	Only the root is now used. It has recently been found to contain an antibiotic of low toxicity. See also "burdock", one of the *Compositae,* (*Bidens connata*) has also been called "cuckold".
Cinnamon	Cinnamomum	U. S. P.	U. S. P.	One of the "century old" drugs which is still official.
Cloves	Caryophyllus	U. S. P.	U. S. P.	Several geographical sources, but very little actual difference.
Dandelion (plant, root)	Taraxacum	U. S. P.	N. F.	The plant was official in the U. S. P. 1831. The root was later official and is now described in the N. F. Leaves used mostly as a food.

Name of Plant (1840)	Identity	Status 1840	Status 1945	Notes
Dragon root	Arum	Sec.	.....	In U. S. P. 1831 secondary list as "Indian turnip". More familiarly known as Jack-in-the-pulpit. At one time used as a stimulant to the secretions, especially for asthma, whooping cough and rheumatism.
Daisy flowers, white (root)	Chrysanthemum Leucanthemum (L.)	.....	.....	According to the U. S. Dispensatory the ground flower heads were used as an adulterant for Dalmatian insect powder. No uses for the root are given.
Dultes	Dulse	.....	.....	Probably the *Rhodomenia palmata,* or "dulse" used in Scotland. Contains a gelatinous principle.
Elder flowers, berries, bark root (dwarf)	Sambucus	Sec.	N. F.	Berries were in secondary list of 1831, but only flowers now official in N. F. Root and bark were at one time used as diuretic, diaphoretic alterative, etc.
Elecampane Root	Inula	Sec.	.....	Official in N. F. *V.* Rarely used today.
Feverfew, herb	Parthenium	.....	.....	One of the *Compositae,* resembling chamomile in appearance and action.
Flaxseed	Linum	U. S. P.	U. S. P.	A perennial and "centennial" necessity, still widely used for a variety of purposes.
Fleabane	Erigeron	Sec.	.....	The oil was official in U. S. P. *VIII.* The herb was described in secondary list of 1831 as *Erigeron Canadense.* (See other species of Erigeron under "scabish".)
Foxglove	Digitalis	U. S. P.	U. S. P.	Needs no further elaboration here. Volumes have been written about it, but we still have much to learn.

Name of Plant (1840)	Identity	Status 1840	Status 1945	Notes
Frostwort	Helianthemum	.....	.....	Fluidextract was official in N. F. *IV*. Not to be confused with Helianthus (common sunflower). Used internally for diarrhea and syphilis, and locally for sore throat and skin diseases.
Garget, or skoke	Phytolacca	Sec.	N. F.	Berries were in 1831 secondary list and were last official in U. S. P. 1890. The root is still official in the N. F.
Goldenrod, sweet	Solidago	Sec.	.....	Official in U. S. P. to 1850. Diuretic, diaphoretic, aromatic astringent.
Goldthread root	Coptis	Sec.	.....	Official to N. F. *V*. For inflammations of the mucous membranes.
Golden Seal	Hydrastis	.....	N. F.	Although this was not described in the 1831 U. S. P. it grew in popularity and is still widely used.
Gravel-root	Actinomeris	.....	.....	Synonyms such as "gravel-weed" for Diervilla, "gravel plant" for Epigaea cause some confusion in establishing identity. In the secondary list of 1831 *Eupatorium purpureum* was also called gravel root (or swamp root) and it might be either this or actinomeris. Since actinomeris was used primarily for dropsy and cystitis it should have first consideration.
Ground Ivy	Hedera	.....	.....	Also known as English Ivy. The ground leaves were used as a local application for old ulcers and other skin diseases.
Gensang root	Ginseng	.....	.....	Official until after U. S. P. 1870. Demulcent and mildly stimulating.

Name of Plant (1840)	Identity	Status 1840	Status 1945	Notes
Ginger	Zingiber	U. S. P.	U. S. P.	No clue is given as to the species or source of this popular and useful drug.
Gums of Various Sorts	(Indefinite)	.....	.....	Many gums and resins were in use in 1840, Copaiba. Galbanum, Gamboge, Guaiac, etc.
Hardhack leaves	Spiraea	Sec.	.....	The root of *S. tomentosa* was formerly official in the U. S. P. Used as an astringent for diarrhea.
Hemlock (Bark, gum)	Hemlock	.....	.....	Bark of *Tsugo canadensis*, containing tannin. Also a source of Canada pitch (gum), which was official in U. S. P. 1880.
Hollyhock flowers	Althaea rosea	.....	.....	An infusion of the flowers was used at one time as an indicator, turning red with acids and bluish-green with alkalies.
Horehound, herb	Marrubium	Sec.	.....	Official until U. S. P. *VIII*. Still used occasionally.
Horseradish leaves	Armoracia	U. S. P.	.....	The root was official in the B. P. 1914. Used for same purpose as mustard. Leaves not used today.
Hysop, herb	Hyssop	.....	.....	The leaves and flowers were at one time used as a stimulant aromatic.
Healall	Prunella	.....	.....	(*Prunella vulgaris*); formerly used for hemorrhages and diarrhea and as a gargle for sore throat. Figwort (*Scrophularia nodosa*) *has* also been called heal-all.
Hops (by the bale)	Humulus	.....	N. F.	The fruit of the hop, Lupulin, is also official in the N. F. and was in the secondary list of 1831.

Name of Plant (1840)	Identity	Status 1840	Status 1945	Notes
Iceland Moss	Cetraria	.....	.....	This was in the U. S. P. 1890, but has since passed out of common usage.
Indian Hemproot	Apocynum	.....	N. F.	Although this is generally called "black hemp" or "hemp dogbane" it is probably the species referred to, rather than Cannabis, or true Indian hemp. Only the leaves and flowering tops of Cannabis are used, rather than the root.
Jerusalem Oak	Chenopodium	U. S. P.	.....	American wormseed (see also "wormseed"). All parts of the plant have been used, and the fruit was formerly official in U. S. P. 1890. The oil is still official in U. S. P.
Johnswort	Hypericum	.....	.....	Also called St. John'swort, *Hypericum perforatum.*
Jacobs Ladder	Celastrus	.....	.....	Also called "false bitter-sweet". Celandine is also called "Jacob's Ladder", but since this has already been listed under "Celandine" probably celastrus is the species meant.
Laurel	Kalmia	.....	.....	Leaves formerly used internally in diarrhea and syphilis and externally in skin disease.
Life-everlasting	Gnaphalium	.....	.....	Used as a tea for intestinal and pulmonary catarrhs. Externally for bruises.
Lily Root White	Lilium	.....	.....	*Lilium candidum* (*L.*). From Asia Minor. Rarely used.
Lily Root Yellow	Convallaria	.....	N. F.	Still used for its "digitalis-like" action.

Name of Plant (1840)	Identity	Status 1840	Status 1945	Notes
Lobelia (herb, seed)	Lobelia	U. S. P.	N. F.	Only the leaves and tops are official today, although the inflated capsules are also used.
Lovage (herb, root)	Levisticum	.....	.....	An aromatic and stimulating herb of European origin. The root is official in the German Pharm.
Lungwort	Pulmonaria	.....	.....	A European herb, formerly used for bronchial affections.
Maidenhair	Adiantum	.....	.....	One time popular in European Pharmacopœias. Also found in U. S. For chronic pulmonary catarrhs.
Mandrake root	Podophyllum	U. S. P.	N. F.	Still widely used.
Mallows, Marsh root	Althaea	.....	U. S. P.	Root only official. Leaves were also official in N. F. *V.*
Mallow, low	Malva	.....	.....	From *Malva rotundifolia.* Usually the leaves were used as an emollient and demulcent.
Marsh Rosemary	Statice	Sec.	.....	Root of *Statice Limonium.* Used locally for ulcers.
Mayweed	Cotula	Sec.	.....	Also called "dog chamomile" and used to adulterate the official species. It has a similar action, and was official in U. S. P. 1870.
Moccasin, or Nerveroot	Cypripedium	.....	.....	Common yellow ladyslipper. Official in N. F. *V.*
Motherwort	Leonurus	.....	.....	An aromatic herb, at one time used for amenorrhea.

Name of Plant (1840)	Identity	Status 1840	Status 1945	Notes
Mountain Ash bark	Sorbus	.....	.....	All parts of the plant have been used as astringents. Recently employed as a cholagogue.
Mountain Mint	Pycnanthemum	.....	.....	Infusion is diaphoretic. Also used in bowel complaints.
Meadow Mint	Spiraea	.....	.....	Probably *Spiraea Ulmaria,* also known as "meadow-sweet" (see also Hardhack).
Mugwort	Artemesia	.....	.....	*A. vulgaris,* formerly official in several European Pharm. Used in chorea, epilepsy and amenorrhea. Same genus as species from which santonin is obtained. (See also Wormwood.)
Mullen leaves (flowers and seeds)	Verbascum	.....	.....	Mullein leaves were official in N. F. *V.* Used for pectoral complaints. The seeds contain a saponin and have been used for poisoning fish.
Man root	Micrampelis	.....	.....	Contains a glycoside, used as an emeto-cathartic.
Myrrh, best	Myrrha	U. S. P.	U. S. P.	Still official, but not much used today.
Noble liverwort	Hepatica	Sec.	.....	Leaves of *Hepatica Americana,* no longer used to any extent.
Nettle root	Urtica	.....	.....	An irritant, used locally; also internally to arrest uterine hemorrhage.
Parsley herb	Petroselinum	Sec.	.....	Root was official in N. F. *IV.* Used in dropsy. Leaves were used to prepare a tea for treatment of dysmenorrhea and other uterine disorders.

Name of Plant (1840)	Identity	Status 1840	Status 1945	Notes
Peppermint	Mentha Piperita	U. S. P.	U. S. P.	The leaves and flowering tops used.
Plantain leaves	Plantain	.....	.....	Leaves of *Plantago major* were used externally as a stimulant in form of a poultice.
Pleurisy root	Asclepias	.....	.....	(See also silkweed.) Several species have been used. Official in N. F. *V*.
Poplar Bark	Liriodendron	Sec.	.....	At one time was official, but not much used today. See also Balm of Gilead buds.
Prickley Ash Bark	Xanthoxylum	Sec.	N. F.	Used for rheumatism and as a gastro-intestinal stimulant. (See also toothache bark.)
Prickley Ash Berries	Xanthoxyli Fructus	Sec.	N. F.	Aromatic.
Pennyroyal	Hedeoma	U. S. P.	.....	Formerly official in U. S. P. *VIII*. Stimulant aromatic-emmenagogue.
Pool Root	Poolwort	.....	.....	One of the *Compositae*. Both *Eupatorium ageratoides* and *E. aromaticum* have been known by this synonym. (See also Thoroughwort.)
Raspberry leaves	Rubus Idaeobatus	.....	.....	The juice of the berries is official in the N. F. Leaves no longer used.
Rue herb	Ruta	.....	.....	Formerly had many uses. Irritant, used locally. Internally as an abortifacient. Official in U. S. P. 1870.

Name of Plant (1840)	Identity	Status 1840	Status 1945	Notes
Saffron	Crocus	U. S. P.	N. F.	Costly drug and therefore subject to frequent adulteration. Formerly used as a sedative and emmenagogue. At present used chiefly to impart color and flavor.
Sage	Salvia	.....	N. F.	Principal use is as a condiment.
Sanicle	Sanicle	.....	.....	Two species are known, *Sanicula Europaea* and *S. Marylandica*. *Eupatorium ageratoides* has also been called "white sanicle".
Sarsaparilla	Sarsaparilla	U. S. P.	U. S. P.	Dried root of several species. Many uses, but today used mostly as a vehicle.
Sassafras Bark	Sassafras	U. S. P.	N. F.	Infusion used for colds, and in preparing collyria.
Savin	Sabina	U. S. P.	.....	Formerly official in U. S. P. *VIII*. Irritant and abortifacient.
Scabish	Erigeron	Sec.	.....	(See also Fleabane.) Certain species of *Erigeron*, probably other than the *Canadense*, although the synonym "scabious" was applied to all. *E. Heterophyllum*, or "sweet scabious" was in the secondary list of 1831.
Silkweed Root	Asclepias	Sec.	.....	(See also pleurisy root.) A species of asclepias (*A. syraica L.*), formerly official in U. S. P. 1840, and in secondary list of 1831.
Skunk Cabbage Root	Dracontium	Sec.	.....	Formerly used as a nerve sedative.

Name of Plant (1840)	Identity	Status 1840	Status 1945	Notes
Slippery elm bark	Ulmus	U. S. P.	U. S. P.	Used for coughs, diarrheas and locally as an emollient.
Snake root (Canada)	Asarum	Sec.	N. F.	Aromatic tonic.
Snake root (Button)	Eryngium	Sec.	.....	Diaphoretic, diuretic and expectorant.
Snake root (Virginia)	Senega	U. S. P.	N. F.	Expectorant. Used in bronchitis and asthma.
Snake-head or Balmony	Chelone	.....	.....	A decoction of the leaves was said to be a valuable tonic and aperient.
Solomon-seal root	Polygonatum	.....	.....	European plant used externally for bruises and eruptions.
Southern Wood	Artemesia	.....	.....	A species of Artemesia. (See also Mugwort.) This species was *A. abrotanum L.* Leaves used as an anthelmintic.
Spearmint	Mentha Viridis	U. S. P.	U. S. P.	Used as a flavoring agent.
Spice or Fever Bush	Prinos	.....	.....	(See also Alder.) Bark formerly official in U. S. P. 1880. Astringent.
Spikenard Root	Aralia	Sec.	N. F.	*Aralia racemosa L.* Several other species were described in the secondary list of 1831. Used but little today.
Sumac (leaves, berries, bark of root)	Rhus	Sec.	.....	Berries formerly described as *Rhus glabrum.* Astringent and irritant.

Name of Plant (1840)	Identity	Status 1840	Status 1945	Notes
Summer Savory	Satureja	.....	.....	Cultivated as a culinary herb.
Sweet Marjorem	Origanum	.....	.....	Aromatic and condiment (Marjoram).
Sweet Fern Sweet Fern Root	Comptonia	.....	.....	Contains tannin and was formerly used as an astringent. Both leaves and root were used.
Sweet Flag	Calamus	Sec.	N. F.	The root contains an aromatic used in flatulence. Also used as a vermifuge.
Sweat Root	Eupatorium	U. S. P.	N. F.	Possibly *Polemonium reptans.* See also Thoroughwort. Eupatorium was also called "sweating-plant," although usually the leaves were used.
Sucory Root	Cichorium	.....	.....	Commonly known as chicory. Used as a substitute for coffee.
Spice of all kinds	(Various)	.....	.....	Most of the commonly used spices were official in 1831.
Tanzy double	Tanacetum	Sec.	.....	Tansy. Official in U. S. P. 1890. Irritant aromatic. Has been used as a vermicide and abortifacient.
Thorn-apple (leaves, root)	Stramonium	U. S. P.	U. S. P.	In 1831 the leaves and seeds were official, but not the root. Only the leaves and tops are official today, although the roots were at one time used extensively.
Thoroughwort	Eupatorium	U. S. P.	N. F.	See also "sweating plant." Commonly known as "boneset" and still widely used.

Name of Plant (1840)	Identity	Status 1840	Status 1945	Notes
Thyme	Thymus	.....	N. F.	Used for respiratory ailments and as a condiment.
Toothache Bark	Xanthoxylum	.....	N. F.	(See also Prickly Ash bark.)
Tamarisk Bark	Gazanjabin	.....	.....	The only reference to Tamarisk is the East Indian "Tamarisk manna," an exudate from *Tamarix gallica*, and resembling the Manna described in the N. F.
Uvca Ursi, or Mountain Cranberry	Uva Ursi	U. S. P.	N. F.	More commonly called "bearberry." Used mostly in urinary ailments.
Unicorn Root	Aletris	Sec.	N. F.	In 1831 secondary list under the name "star-grass."
Vervain herb	Verbena	.....	.....	One time official (in N. F. *IV*). Used for colds, fevers, dysmenorrhea.
Water Pepper, or Smart Weed	Bistort	.....	.....	A species of the Polygonaceae (*P. hydropiper L.*). Related to bistort. Leaves used for many purposes, including the treatment of internal hemorrhages.
White Helebore	Veratrum (album)	U. S. P.	.....	Both this species and *V. Viride* were official in 1831. The *album* is no longer recognized.
White Oak Bark	Quercus	U. S. P.	.....	Formerly official in N. F. *V*. Used as an astringent.
White Pine Bark	Pinus alba	.....	N. F.	Still used in the preparation of cough remedies.
Whitewood Bark	Canella	U. S. P.	.....	Official in N. F. *V*. A bitter aromatic used chiefly as a condiment.

Name of Plant (1840)	Identity	Status 1840	Status 1945	Notes
Wild Indigo Root	Baptisia	.....	.....	Was official in N. F. *V*. Used very little today. Formerly used both internally and externally for septic conditions.
Wintergreen pipsis	Chimaphila	U. S. P.	N. F.	Also commonly known as "pipsissewa." Still occasionally used as a diuretic.
Witch Hazel (leaves, bark)	Hamamelis	.....	N. F.	Only the leaves are official, although the bark was widely used at one time. The bark was formerly recognized in the B. P.
Wormwood herb	Absinthium	.....	.....	(See also Mugwort.) Formerly official in N. F. *IV* as dried leaves and flowering tops of *Artemesia Absinthium L.*).
Wormseed	Chenopodium	U. S. P.	.....	(See also Jerusalem Oak.)
Yarrow	Achillea	.....	.....	Formerly official in U. S. P. 1870. Used as a tea in amenorrhea and as a sudorific.
Yellow Dock	Rumex	.....	.....	Official in N. F. *V* and formerly used in syphilis and chronic skin diseases.
Yellow Parilla	Menispermum	.....	.....	Official U. S. P. 1890. A substitute for sarsaparilla.

A recapitulation shows that 33 per cent of the drugs recognized as U. S. P. in 1840 have retained that status, while another 33 per cent have passed into the N. F. The remaining 33 per cent are no longer official.

Of the drugs described in the Catalogus Secundarius 29 per cent have retained their status, being listed in the present N. F. The others have been eliminated from all official recognition.

Quite a few of the drugs not official in 1840 later gained in popularity, and of these 23 per cent are recognized today in the U. S. P. and N. F. This is perhaps more surprising than the large number which have remained *in status quo.*

This type of tabulation, based on drugs actually stocked and commonly sold, is perhaps more nearly an accurate gauge of the trend than a mere comparison of drugs listed in the U. S. P. and other compendia of the time. It represents what was *actually being used,* not merely those drugs which were considered *fit for use.*

All in all the trend does *not* appear to be in the direction of complete extinction of botanic simples, as so many of our foremost pharmaceutical prognosticators state. Perhaps this reasoning has been brought out by the intensive and extensive interest in synthetic organic compounds during the past few decades. It seems to this observer that perhaps an important part of the materia medica of the future is locked up in the "century old" botanicals, and it remains only for enterprising pharmaceutical chemists to unlock Nature's doors with the keys which modern scientific methods give us.

Certainly the "century old" botanicals are far from dead, and their vitality remains a challenge to each one of us.

If the collection of relics of the past—such as old letters which made this paper possible—does no more than stimulate our thoughts into productive channels, it is time and effort profitably spent for our profession at large, as well as relaxation and enjoyment for the individual hobbyist.

THE COMPARATIVE TOXICITY AND EFFECTIVENESS OF SCOPOLAMINE HYDROBROMIDE ($C_{17}H_{21}O_4N$. HBr) AND SCOPOLAMINE AMINOXIDE HYDROBROMIDE ($C_{17}H_{21}O_5N$. HBr)

By Co Tui, M. D., and Claude Debruille *

Historical Review

THE hydrobromide is the best known and most universally used of the salts of scopolamine available in therapeutics. It has been employed in "twilight sleep," (1) as a pre-anesthetic medication, (2) in the treatment of morphine addiction, (3) in Parkinsonism, and in motion sickness. (4)

Less known is Scopolamine Aminoxide Hydrobromide, which was first prepared and put into therapeutic trial by the Polonovskis, (5) under the name of Genoscopolamine, in the years between 1925 and 1930. This salt, too, has been used for the production of "'twilight sleep" (6) and in the treatment of Parkinsonism. (7) (8) (9). The Polonovskis found that the Scopolamine Aminoxide Hydrobromide (SAH) salt was two hundred times less toxic than the Scopolamine Hydrobromide (SH) and that as much as 1.25 grams could be injected into a six-kilogram dog without fatality. With 100 mgm. per kilogram given intravenously, torpor and deep anesthesia were obtained. With larger doses, there was violent cerebral excitation, the dogs presenting the appearance of madness, which phenomenon disappeared rapidly. This information, however, is scarcely adequate pharmacological knowledge.

In the work reported below, an attempt has been made to study the toxicity of the SAH and to compare its toxicity, effectiveness and duration of action with the effects of SH.

Part I. Comparative Toxicity

Method: For a comparison of the lethal effectiveness of these two salts, it was decided to use the minimum lethal dose in white mice as a criterion. The white mice were fasted for twelve hours

* From the Laboratory of Experimental Surgery, New York University College of Medicine; and the Laboratories of the Debruille Chemical Corporation.

and then weighed. The SH was dissolved in 2 per cent and the SAH in 6 per cent aqueous solutions. The calculated volume was injected subcutaneously in the abdominal wall, using an insulin syringe calibrated in hundredths. In order to avoid the error of including animals in which the drugs had been injected into the peritoneal cavity, animals in which no wheal was raised by the injection were discarded. Immediately after injection, the animals were placed back in the cages for observation.

Phenomenology of Scopolamine Intoxication: With the SH, in doses under .4 mgm. per gram mouse there was no perceptible change in the behavior of the animals. With higher doses, there might be said to be three zones of effect. Between .4 and .45 mgm., most animals were somnolent. Between .45 and .5, the animals were first somnolent, then irritable and restless, then "jumpy," running around with jerky movements, finally becoming subconvulsive. Larger doses were convulsive, often fatal, death usually being preceded by a short period of coma. The convulsions were clonic, the muscles contracting in spasms, during which the animal may be thrown several inches up into the air. The ensuing coma merges insensibly into death, the only perceptible signs being glazing of the eyes and marked cyanosis. The time between the injection and death is usually from eight to twelve minutes, the animals having the larger doses succumbing more promptly. In a few exceptional cases, death was postponed for over an hour. When recovery took place, the different stages were passed through in the reverse order. Complete recovery, as far as could be observed, usually took place in from a half hour to forty-five minutes, after which the animals were usually well enough to feed.

It will be seen from Table I that the minimum lethal dose of the SH (the point where half of the treated animals died) was .5875 mgm. per gram mouse. This figure differs significantly from that determined by Smith (10) which was between .7 and 1.3 mgm. The spread beneath the maximum sub-lethal dose (.55) and the sure lethal dose (.675) was only 14 per cent. Table II shows analogous experiments on the SAH. Here the minimum lethal dose is 3.325 mgm. per gram mouse. This makes the SAH 5.7 times less toxic than the SH. The spread between the maximum sub-lethal dose and the sure lethal dose, lying between 2.75 and 3.375, was greater, or a spread of 23 per cent. The symptomatology of SAH poisoning was practically identical with that of SH poisoning, the only differ-

ence being that the recovery seemed more prompt in the case of the SAH.

TABLE I

Minimum Lethal Dose—Scopolamine Hydrobromide in White Mice

Dose of Scopolamine Hydrobromide Per Gram Mouse mgm.	Number of Animals Injected	Number of Living Over Number Dead
.55	8	8/0
.57	8	6/2
.58	12	8/4
.5875	20	10/10
.59	12	4/8
.625	8	0/8
Total	68	

TABLE II

Minimum Lethal Dose—Scopolamine Aminoxide Hydrobomide in White Mice

Dose of Scopolamine Aminoxide Hydrobromide Per Gram Mouse mgm.	Number of Animals Injected	Number of Living Over Number Dead
2.75	8	8/0
3.00	8	6/2
3.25	12	8/4
3.325	20	10/10
3.35	8	2/6
3.375	8	0/8
Total	64	

If these doses were to apply in dogs and men, the lethal dose of SH would be 3.525 grams and 35.25 respectively and 20.25 and 202.5 grams of the SAH respectively for a six-kilo dog and a sixty-kilogram man. This may explain the inability of the Polonovskis to kill their experimental animals. It implies a theoretical spread of 117,500 times between the lethal dose and the therapeutic dose in man for the SH (therapeutic dose .3 mgm.) and a spread of 202,500 times for the SAH (therapeutic dose 1 mgm.).

Part II. Comparative Effectiveness

To test the comparative effectiveness of the two salts, it was decided to use an adaptation of the method described by Kühl (11)

in 1926 for the bio-assay of atropine and scopolamine. Briefly, this method made use of the abolition of the acetylcholine depressor effect on the blood pressure of the cat brought about by the administration of atropine or scopolamine.

The following preparative procedure was employed. One-half hour before the experiment, the cat was given urethane (100 mgm./Kgm.) by stomach tube. When the animal became unconscious, it was given intravenously 7.5 mgm./Kgm. body weight of nembutal (pentothal sodium). This combination produced an even anesthesia. The animal was then cannulated for blood pressure tracing, using either one of the carotid or one of the femoral arteries. One of the femoral veins (the opposite one if a femoral artery is cannulated) was prepared for intravenous injections which were administered in a calibrated insulin syringe armed with a hypodermic needle. As far as possible, the same puncture hole was used throughout the experiment, the small clot forming around the puncture preventing bleeding from the puncture. After this, liquaemin was injected (1/4 cc./Kgm.) to prevent clotting in the blood pressure tracing system for the duration of the experiment.

It took a combination of the findings of Kühl (11) and twenty-eight preliminary experiments on our part to arrive at the proper dosage relationships of the three drugs and to enable the completion of the ten final experiments (Table III) in which the two salts could be compared with each other in the same cat. These preliminary experiments determined that (a) a dose of .1γ of acetylcholine per kilogram cat produced depressor effects varying from 3 to 6.5 mm. Hg. This was taken as the standard threshold dose; (b) it takes from .1γ to .15γ of SH per kilogram cat and from .25γ to .45γ of the SAH to abolish this threshold effect. In making these injections it is important not to disturb the femoral nerve in order to avoid a false depressor response.

The final experiments were performed in three parts: (a) determining the consistent effect of the threshold dose of acetylcholine; (b) and (c) determining respectively the minimum paralyzing dose of either of these two salts on the threshold effect. In five of the experiments, it was the SH and in the other five the SAH which was tested first. In between parts (b) and (c) the animal was given an hour's rest, at the end of which rest period it was given 10 cc. of physiological saline per kilogram body weight to replace fluid loss.

TABLE III

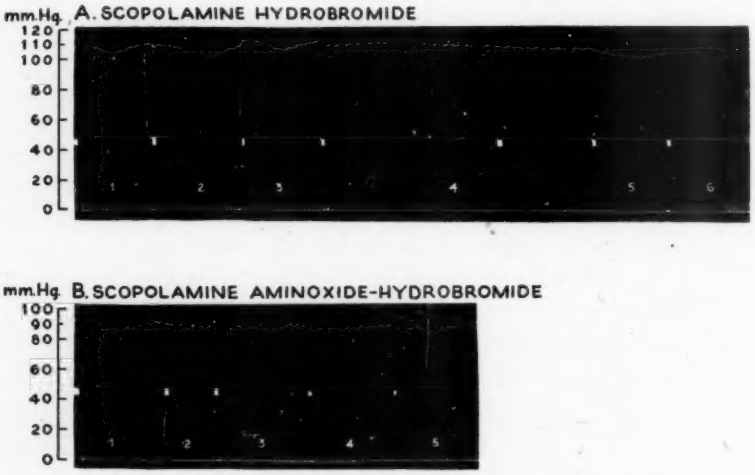
Effects of Scopolamine Hydrobromide (SH) and Scopolamine Aminoxide Hydrobromide (SAH) on Depressor Effect of Acetylcholine in the Cat

Cat and Experiment Number	Weight Kgm.	Depressor Effect MM. Hg.	Minimum Paralytic Dose (SH)/Kgm.	Duration of Paralysis Minutes	Minimum Paralytic Dose (SAH)/Kgm.	Duration of Paralysis Minutes
1	2.5	3	.1	82	.3	30
2	2.25	4	.1	91	.3	25
3	3.0	4	.15	82	.45	32
4	3.5	3	.15	90	.4	28
5	3.75	5	.1	75	.3	30
6	2.5	6	.15	82	.45	33
7	3.0	5	.1	84	.25	30
8	2.5	4	.15	92	.4	30
9	2.25	6	.15	90	.45	32
10	2.75	5	.15	85	.4	31
Average		4.1	.135	85.3	.37	27.4

The experiments were conducted as follows: When the animal preparation was ready, the depressor effects of acetylcholine were determined in three preliminary injections in doses of .1γ to .15γ and again .1γ per kilogram cat. If the effect of .15γ was larger than that of .1γ, the depressor phenomenon was interpreted as cholinergic. If the second dose of .1γ reproduced the effects of the first dose, the animal was ready for the first injection of either salt. If not, repeated sets of injections of .1γ and .15γ were given until three such sets reproduced the same results.

The salts were given in a starting dose of .1γ /Kgm. for the SH and .3γ /Kgm. for the SAH. This first dose might be either too weak, too potent or just right. In the first case the depressor effect of the threshold dose of acetylcholine was not abolished, and the scopolamine dosage had to be increased (increments of .05γ /Kgm.). In the second case, not only was the threshold effect abolished, but also that of .15γ /Kgm. The scopolamine dosage was then reduced (decrement also of .05γ /Kgm.). Because of the necessity for this type of adjustment, some experiments were more prolonged than others, the time varying from four to seven hours. At one extreme, experiments 1, 2 and 5 (Table III) consumed the least time because the starting doses of both the SH and the SAH were just right. At the other extreme, experiments 3, 6 and 9 (Table III) each necessitated two levels of dosage for the SH and four levels for the SAH, entailing an additional period of almost

three hours. The kymogram of one such an experiment is shown in Figure 1.



COMPARATIVE EFFECTS OF SCOPOLAMINE HYDROBROMIDE (SH) AND SCOPOLAMINE AMINOXIDE HYDROBROMIDE (SAH) ON THE THRESHOLD DEPRESSOR EFFECT OF ACETYLCHOLINE ON THE CAT

Cat, weight 2½ Kgm. Urethane—Nembutal anesthesia as per text. Test injections of acetylcholine, SH and SAH all made intravenously. Time marked in seconds.

A.	Panel 1	11:01 a. m.	Depressor effect of .1γ acetylcholine per kilogram. Fall—4 mm.
	Panel 2	11:04	Effect of .15γ of acetylcholine. Fall—6 mm.
	Panel 3	11:07	Effect of .1γ of acetylcholine. Fall—4 mm.
	Panel 4	11:10	First signal magnet mark—.1γ of SH per kilogram body weight. Second signal magnet mark—.1γ acetylcholine. No fall.
	Panel 5	1:30 p. m.	Effect of .1γ acetylcholine—2 mm. fall, showing partial return.
	Panel 6	1:40	Effect of .1γ acetylcholine—4 mm. fall, showing complete return.
B.	Panel 1	2:50 p. m.	Effect of .1γ acetylcholine. Fall 5 mm.
	Panel 2	2:53	.3γ SAH.
	Panel 3	2:56	Effect of .1γ acetylcholine. No fall, showing paralysis.
	Panel 4	3:06	Effect of .1γ acetylcholine. Slight fall, showing partial return.
	Panel 5	3:16	Effect of .1γ acetylcholine. Fall—5 mm. complete return.

As may be seen from Table III, the depressor effect produced by the threshold dose of acetylcholine was from 3 to 6.5 mm., averaging 5 mm. The minimum paralytic dose of the SH varied from .1 to .15γ /kilogram body weight. The duration of effect was from eighty-two to ninety-two minutes. The minimum paralytic dose of the SAH varied from .25 to .45 gamma per kilogram body weight, averaging .37γ, and the duration of effect from twenty-five to thirty-three minutes, averaging 27.4 minutes. It thus appears that: (1) the SH is 2.74 times as potent as the SAH and its effect lasts 3.1 times as long. The greater variability of SAH effects finds a parallel in the greater spread of its lethal dosage as shown in Part I of this paper.

Finally, some of the arbitrary points in technique adopted in this study make it less precise than it would be otherwise. Thus, in using ten-minute intervals for testing, if recovery took place in seventy-five minutes, it would not be discovered until the 80th minute, and the percentage of error would be 14 per cent. Again, the increment by .05γ in the dosage of both the salts means a more precise work on the part of SH than of the SAH; .05γ in an original dose of .3γ is only 17 per cent, while in an original dose of .1γ, it is 50 per cent.

Comment

A combination of the experiments in Parts I and II would seem to indicate that while the symptomatology of intoxication of the SH and the SAH are similar, the latter is one-third as potent as the former and one-sixth as toxic. In isopotent doses, the effect of the SAH seems to last only one-third as long as that of the SH.

It may be permissible to speculate on the place which a drug with the relatively low toxicity and fleeting action might have in therapeutics. As a premedication in short operations and particularly as a motion sickness remedy in short trips, such a drug may well have a place worth testing clinically.

Summary and Conclusions

1. In experiments on the white mice and bio-assay experiments in the cat, it appears that the SAH is about one-sixth as toxic as the SH and one-third as potent. In isopotent doses the effect of the former seems to be one-third as long lasting as that of the latter.

2. The possible uses of the aminoxide as a pre-anesthetic medication and as a motion sickness remedy have been discussed above.

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ALCOHOL BEVERAGES AND GENUS HOMO SAPIENS

By T. Swann Harding *

BACK in 1940 a famous old French physician, Dr. Jean Besancon, achieved the age of eighty and gave his recipe for longevity thus: "Don't drink water, take as little exercise as possible, and have an afternoon highball instead of tea." He went on that anyone who drank water in his old age was crazy. He thought tea possibly did no harm—there is some physiological evidence that it can do considerable—and wound up, "of the English drinks I prefer whisky, and it is better for oldsters."

This naturally reminds us of the more famous physician who declared that the man who drank before forty was a fool, but that the man who did *not* drink after forty was a damned fool. Yet, in spite of the fact that such scientific evidence as we have militates against the idea that moderate drinking of alcoholic liquors (one or two drinks daily of the usual size and authority) is harmful to human beings, the quaint, but often undelightful superstition seems immortal that such beverages are harmful in any quantity.

Two important points should be mentioned at once. One is that physicians, psychiatrists, and others who have studied the matter most, are in agreement that moderate drinking is much more common than excessive drinking. They also know that the dipsomaniac, or the individual who goes on periodic sprees, is not led thereto by moderate drinking.

Millions of moderate drinkers never once exceed their quotas throughout long lives. Those who habitually drink to excess are sick mentally or nervously, and would be led to perdition by that alone, or something else, if not by alcohol. Getting fully intoxicated on rare occasions, once or twice annually, has no significance to scientists—only to fanatics. Furthermore many heavy drinkers can and do quit completely, for no discernible reason, and many who went on sprees for a while as suddenly settle down to moderation the rest of their lives.

The second point is that grain or ethyl alcohol is the sole toxic substance present in alcoholic beverages capable of producing any con-

* Granite Gables, 400 Linden Lane, Falls Church, Va.

siderable effects on human beings, good or ill. The other ingredients are present in distilled liquors in quantities too small to have significance. These substances in certain liquors can produce headaches and hangovers, usually in those who are allergic to them. Rum probably produces fewer such melancholy manifestations than whisky because it contains fewer trace ingredients. Finally, some people are allergic to alcohol itself and cannot drink it anyway.

The *Journal of the American Medical Association* for June 18, 1942, editorially discussed the role of alcohol in the etiology of, or in causing, nephritis, an acute or chronic kidney inflammation. The *Journal* remarked that we were just then emerging from an era when many health problems were quite improperly regarded as moral in nature, rather than as purely medical. To the pure all things are indecent. To those who do not dare to do the things that others care to do, these things often become laden with evil far beyond the ability of science to effect confirmation.

It has long been a cherished tradition of propagandist moralistic hygiene that alcohol has a singularly devastating effect on the heart, the blood vessels, the liver, and the kidneys. This view still lingers in many moralistic medical treatises and is fundamental to the religious solutions offered for the "alcohol problem." Yet pathologists who have examined literally thousands of alcoholics and nonalcoholics post mortem fail to find that alcohol has selected the circulatory system as the special field of its nefarious toxic activities.

In short, the insides of alcoholics and nonalcoholics turn out to be very much alike when viewed as so much meat, or so many tissue specimens. The assumption that alcoholism and nephritis—or for that matter cirrhosis of the liver—go hand in hand, is pure tradition, nothing more. Hepatic lesions are common in alcoholics, as they are in other people. The same may be said for chronic gastritis. But the kidneys of heavy drinkers are usually in excellent shape. Neither is there much evidence of arterial degeneration. In fact the arteries and blood vessels of drinkers are more often in better rather than in worse shape than those of nondrinkers of the same age and general life habit.

In one set of nearly fifty cases of actual nephritis in life only five gave a history of the excessive use of alcohol. So much for what our leading medical journal had to say in a single editorial. Workers at the Mayo Clinic who devoted a great deal of time to the problem went

even further. After exhaustive investigation they became convinced that there was no evidence that alcohol caused that old temperance lecturer's standby, cirrhosis of the liver. The liver hardens in this disease, gets leatherlike, and its functions are impaired.

Experimental work has indicated that, if a man regularly drinks a quart of liquor a day—certainly not moderation—he develops a fatty or fatted liver. But a fatty liver is not ordinarily harmful. Moreover an increased carbohydrate intake—more pretzels with the beer, more sandwiches with the cocktails—would go far to prevent even that development. For the fat content of the liver can be reduced by eating a diet high in starch and sugar.

But an analysis of four thousand consecutive autopsies at the Philadelphia General Hospital convinced the gentlemen in charge of this rather morbid enterprise that alcohol could not be regarded as a specific factor in the production of cirrhosis of the liver. Neither, for that matter, could gross lesions in the digestive tract be caused by ulcer, cancer, or gallbladder disease. These physicians then suggested the abandonment of the term "alcoholic cirrhosis" as referring to nothing. (*Journal of the American Medical Association,* October 10, 1936, pp. 1200-1202.)

As to chronic gastritis: Two other physicians reported (*Journal of the American Medical Association,* September 20, 1941, pp. 1005-1011) studying a hundred men who had consumed nearly three pints of alcoholic liquor daily for twenty years, and that, brethren, in a comprehensive sense, is drinking. They found the stomachs perfectly normal in more than half of their subjects. Had they been food gluttons, or aspirin addicts, as so many moralistic people happily are, scarcely a one of them would have had a normal stomach.

The gastric diseases observed in the remaining forty-five men were superficial and bothered them little. They were no more significant than in the normal run of men. There was no correlation whatever between the duration of alcoholism, the quantity of alcohol consumed, the abuse of nicotine, dental infections, or vitamin deficiencies, and the severity of the gastritis! Read that over, think it out, and see how remarkable it really is.

Now it is difficult to see how the stomach can withstand assaults of from four to five pints of 20 to 90 per cent ethyl alcohol a day for some twenty to forty years, without ripping into tatters or starting a slow leak, but it can. When you remember the enormous

quantities of soft-drink, highly indigestible candy bars, hot dogs, rancid coffee, and other inedible concoctions with which Americans habitually insult their stomachs, this is not so difficult to understand.

Yet most life-long drinkers who have carried the thing to terrific excess wind up dying of something not remotely related to the bottle and with perfectly normal, soft orange-red, youthfully pliable gastric mucosa (high-toned for the lining of the stomach). Of course, viewed merely as poisons, the toxic substances in tobacco, coffee, tea, and even cocoa could be far more harmful to the human physiology than grain alcohol, when abused, but many also consume these poisons to excess and with perfect impunity. It is all very discouraging to one who wants to reform those who are intemperate about food or drink!

When it comes to the types of high blood pressure or heart ailments superinduced by fluttery nervous emotions, a drink or two has its place in the scheme of things for its medicinal quality. For alcohol is a sedative narcotic, not a stimulant; it makes the unruly emotions lie down and go to sleep, and tides the victim over crises. Actual and frequent drunkenness is rather the obvious sign of incipient mental disorder or psychosis than the cause thereof. There is no evidence whatever that alcohol causes nerve lesions.

The high mortality of alcoholics from pneumonia seems fairly well established. But a self-confessed heavy drinker who is not an alcoholic, and who is therefore well balanced mentally and emotionally, like Winston Churchill, could throw off two attacks of pneumonia in close succession when about seventy and in a way many a younger and temperate man might envy.

On the contrary there is evidence that drinking alcoholic liquors tends to ameliorate rather than to cause arteriosclerosis or hardening of the arteries. Hence moderate drinking is almost certainly beneficial for victims of high blood pressure in any form.

It is true that actual alcoholics often neglect to eat and go to the point where their absorption of vitamins is impaired and a condition called avitaminosis, a kind of incipient pellagra, sets in, but that is true in the main of psychotics who are almost constantly debauched.

On the other hand there is scientific evidence to show that drinking alcoholic liquor mobilizes the vitamin A we have in our bodies, puts it into the blood stream, and enables it to work for us. The usual evening of social drinking, where nobody gets drunk, will

demonstrably produce this effect. It also demonstrably helps human vision by night.

That is not an argument to the effect that people should drink to restore night vision. If they have to do the driving home, two drinks are sufficient regardless. The point merely is that there can be cited advantages and disadvantages for the pursuit of any form of conduct we care to consider. For instance, water is certainly beneficial, yet it can be poisonous. A condition called water intoxication—acute, terribly painful, and which can be fatal, develops when too much water is absorbed by human beings.

It is well known that distilled water is highly toxic to many fresh-water organisms. But human beings who drink large quantities of water for experimental reasons, or because afflicted with diabetes insipidus, suffer from water accumulation in their bodies which results in toxicity. When the salt-to-water equilibrium of the body fluids is destroyed by excessive water drinking, vomiting, salivation, convulsions, weakness, stupor, flaccidity, abject helplessness, and death supervene—unless salt is administered. The picture is largely one of drunkenness.

However, we should certainly not stop drinking water because its excessive use can produce such symptoms. We should use it temperately as we should also use cola drinks, tobacco, hot dogs, spring onions, lobster, and whisky. We come finally to consider the general effects of alcoholic beverages on reproduction and offspring.

Such evidence as science has accumulated indicates that the excessive use of alcoholic liquor tends to kill off inferior male sperm, thus leaving only the stronger spermatozoa to meet ova and reproduce. Hence the offspring of alcoholics are likely to be stronger than the offspring of nonalcoholics among whom the weaker sperm can remain alive and perpetuate themselves. Alcoholic offspring are also usually superior in useful qualities because alcohol has a eugenically toxic action on feeble germ cells.

Then what of the offspring after they arrive? The most famous piece of carefully controlled work done on that subject was performed by the famous Karl Pearson and associates, and was published from the University of London's Francis Galton Laboratory for National Eugenics in 1910. Because the results conflicted with the myths held sacred by moralistic and religious sects they excited considerable hostility.

Pearson and his coworkers wrote in summation: "To sum up then, no marked relation has been found between the intelligence, physique, or disease of the offspring and parental alcoholism in any of the categories investigated. . . . On the whole the balance turns as often in favor of the alcoholic as of the non-alcoholic parentage." Oddly enough, the general health of the children of alcoholics was better than that of children sired by sober citizens. There were fewer delicate children, while tuberculosis and epilepsy were markedly less frequent.

What does this mean? Alcoholics had more children than did nonalcoholics; fewer of them survived, hence the average family sizes were ultimately the same, and the children of the alcoholics who did survive were good specimens. The results could possibly mean that the physically strongest adult members of a community have the greatest desire for and capacity to endure alcohol! But parental alcoholism was not a source of mental or emotional defects in offspring and the survivors were fitter also.

More recently (*Quarterly Journal of Studies on Alcohol,* December 1944, pp. 378-393) an American investigator reported on the adult adjustment of the children of alcoholic parents. There have been innumerable reports that infant mortality, epilepsy, idiocy, psychotic, and alcoholic rates were very high in the children of alcoholic parents. Once more, however, facts confute assumptions.

In this study the former children of alcoholics, now adults of course, were divided into groups representing alcoholic and normal parentage. Fathers in the former group also showed other deviations into criminality and whatnot. In this study the parents were really heavy drinkers too and no mistake. But this had not perceptibly hurt the chances of their now grown-up children who had all been placed in foster homes.

Both groups of offspring showed an over-all adult adjustment to life which compared favorably with that of the general population. The children of the alcoholics did quite as well as those of the sober citizens. No drunks developed in either group; in fact there was little heavy drinking among any of the offspring, showing that like-father-like-son is not an inerrant rule. Adjustments to occupations and marriage were generally good in both groups.

As important as anything is the fact that the children of inebriates had no greater tendency to become inebriates than did people who

sprang from sober parents. However, these were all children from well-supervised foster homes wherein environmental conditions were far better than they are in many natural homes. But drinking is a poor method to produce inferior offspring.

As to length of life, the late Raymond Pearl, who probably did more reliable work on this subject than any contemporary American scientist, found that, while excessive drinkers went to their graves slightly sooner (a couple of years perhaps) than did abstainers, moderate drinkers lived longer on the average than abstainers. However, tobacco definitely impaired life duration even when used moderately. Heavy smokers had a poorer chance to live long than did heavy drinkers.

In view of their toxicity, it is almost certain that investigation would prove that excessive users of coffee, tea, cocoa, and other mild poisons shorten their lives. Excessive physical exercise will do this. Hence one must balance the pleasure against the loss in years and perhaps many a heavy drinker would actually prefer a shorter but a more intoxicated life.

After the age of forty any occupation which demands considerable physical exertion, whether indoors or outdoors, tends greatly to shorten life. The selection of long-lived parents and grandparents is the most important and most neglected item in preparing to become a centenarian. A slow pulse and moderate body weight also help us on to longevity, though many short lives are more productive and more pleasant than long ones could ever be, viewed from a profit-and-loss standpoint.

It is about time for some conclusions.

It is quite impossible to run a fully controlled experiment on the effects of alcohol upon human beings. To do so one would have to breed many series of identical twins and then run paired experiments on them, letting one drink immoderately and the other not at all, from youth until death. Several such experiments might give us a final clue. Until they are run, no one can say with certainty that alcohol is harmful or harmless to human beings as ordinarily taken.

However, such controlled and relatively reliable scientific evidence as has accumulated indicates that the moderate use of alcoholic liquors is probably more beneficial than harmful. Excessive use is undoubtedly harmful, but that can be said of the excessive use of any food or beverage whatever, and is meaningless. Moreover, the indi-

viduals who pass from the moderate, controlled use to immoderate and excessive swilling of alcoholic liquors suffer from physical, nervous, or mental defects of a serious character, alcohol or none.

It is now definitely known that the consumption of alcohol does not cause many of the specific diseases of which it was long supposedly the cause. Moderate drinking has no apparent effect upon reproduction, the circulatory or urinary systems, the digestive system, general resistance to disease, longevity, intelligence, or the nervous system. The weaker the alcohol in the drink and the longer the period between drinks the better.

Individual tolerance of alcohol varies almost certainly with the ability of the individual's metabolism quickly to oxidize alcohol and rid the body of it. An unstable make-up rather than the mere taking of a drink leads to habitual drinking. The immoderate use of alcoholic liquor does conduce to automobile accidents, but its use in moderation conduces neither to this nor any sort of crime. Drinks do add calories to the diet, for alcohol is definitely a food. The idea that mixing drinks conduces to quick intoxications is, as you doubtless know, a myth. The total quantity of alcohol consumed and the quantity in the blood determines drunkenness, not the medium in which the alcohol is imbibed.

However, this should be said. When such facts were stated in a temperate, conservative, scientific, fully documented study entitled Alcohol in Moderation and Excess, prepared by two medical college professors of pharmacology, by and with the advice of a distinguished group of physicians, the book ran into trouble. The Virginia State Assembly had provided for such a study to be used educationally, yet it would not accept this scientific work, and a thousand copies of it were burned in true Nazi fashion. Other States, of course, have a higher standard of civilization than Virginia.

But Nazism will persist so long as absolutism persists, and absolutists will stand you down regarding the harmfulness of drinking alcoholic liquors in moderation, scientific fact to the contrary notwithstanding. Yet the facts indicate that alcoholic liquors also are food beverages and, if not abused, will no more harm than will other foods to which we are not allergic or which do not habitually give us mild or worse indigestion.

SELECTED ABSTRACTS

Oral Administration of Penicillin in Corn Oil and Lanolin. D. Perlstein, R. G. Kluener and A. J. Liebmann. *Science 102,* 66 (1945). Equal parts by weight of anhydrous lanolin U. S. P. and corn oil were heated to 55-60° C., mixed well in a Micro-mincer, and allowed to cool to 40° C.; penicillin calcium was then incorporated in an amount sufficient to represent 55,000 Oxford units per dose. The preparation was dispensed in No. 1 gelatin capsules.

One capsule was administered orally to each subject in the morning following an overnight fast. The urinary excretion of penicillin was determined by the Rammelkamp method upon an aliquot of a 48-hour specimen.

For a 24-hour period, the average total recovery of penicillin from the urine of the test subjects was 14 to 16 per cent, in contrast to a figure of 2 to 3 per cent obtained from control subjects who received the same oral dose of penicillin in normal saline solution.

In one group of subjects (predominantly males) the highest level of penicillin appeared in the urine in approximately 2 hours, whereas in a second group (predominantly females) it was not reached until about 8 hours. No explanation for this difference is suggested by the authors.

Small but measurable quantities of penicillin were found in the urine of some subjects for more than 42 hours.

Streptomyces Antibiotics. I. Crystalline Salts of Streptomycin and Streptothricin. F. A. Kuehl, Jr., R. L. Peck, A. Walti and K. Folkers. *Science 102,* 34 (1945). When rather highly purified concentrates of streptomycin were treated with methyl orange (the sodium salt of helianthine) streptomycin helianthate was obtained in crystalline form. Recrystallized from diluted methanol, this compound possessed solvent of crystallization; on heating at 100° *in vacuo* the anhydrous form, m. p. 220-226° d. (micro-block), was obtained.

The helianthate was found to have an activity of about 350 units /mg. when tested against *B. subtilis* by a cup assay method.

Streptomycin hydrochloride was prepared by treating the helianthate with a mixture of methanol and hydrochloric acid, removing the helianthine, and precipitating the hydrochloride from the filtrate by adding ether. After being dried at 25° ***in vacuo*** over phosphorus pentoxide, the hydrochloride had $[\alpha]_D$ — 84° (C = 0.5 per cent, in water), and an activity of about 800 units /mg. Its molecular weight is believed to be about 700.

Data are presented on microanalytical determinations of the helianthate and hydrochloride, and on the ultraviolet absorption spectra of streptomycin in various solvents buffered to different pH values.

Streptomycin sulfate was also obtained in crystalline form, and was found to have an activity of about 520 units /mg.

The crystalline salt of streptomycin and *p*-(2-hydroxy-1-naphthylazo)-benzenesulfonic acid was prepared from streptomycin hydrochloride and Orange II. This compound had an activity of about 300 units /mg.

Streptothricin helianthate, prepared by the method described above, possessed an activity of about 400 units /mg., and had m. p. 220-225° d. (micro-block).

Stability of Sodium Salicylate Solutions. F. Reimers. *Dansk Tidsskr. Farm. 18,* 215 (1944); through *Quart. J. Pharm. & Pharmacol. 18,* 138 (1945). The discoloration which occurs in solutions of sodium salicylate containing bicarbonate has been shown to be due to oxidation, first to 2,5-dihydroxyquinone and then further to a brown substance of the formula $C_{12}H_8O_6$, which has three hydroxyl groups.

The presence of traces of manganese in the bicarbonate has been shown to be responsible for the discoloration. It may be prevented by the addition of 0.25 per cent of sodium pyrophosphate. It was also shown that the discoloration does not occur if the bicarbonate is replaced by buffer solution, or by carbonate or hydroxide, and/or if thiosulfate or thiourea is added.

Dextran as a Substitute for Plasma. A. Grönwall and B. Ingelman. *Nature, Lond. 155,* 45 (1945); through *Quart. J. Pharm. & Pharmacol. 18,* 142 (1945). Dextran is a water-soluble polysaccharide composed of glucose units linked together in long, more or less branched chains of high molecular weight; it is formed in solutions of sugar infected with the bacterium *Leuconostoe mesenteroides.*

Carefully controlled partial hydrolysis of dextran produces a solution in which the solute has a molecular weight suitable for intravenous administration. A six per cent solution of the product, with from one to three per cent of sodium chloride, has a viscosity and colloidal osmotic pressure of the same order as those of blood. Solutions of the preparation can be autoclaved and may be packaged in this form or in dry powder.

Studies on dogs revealed that after intravenous injection, the blood level of the drug fell to zero in three to four days, during which time dextran of lower molecular weight was detected in the urine. No storage of dextran in the organs could be detected histologically.

The therapeutic effect of the substance was investigated experimentally in cases of shock from bleeding, histamine shock and contusion shock. Rapid and lasting effects on blood pressure, heart action and respiration were always noted. The drug is now receiving clinical study.

Cerebral Intoxication the Result of Trichlorethylene. N. K. Rickles. *Northwest Med. 44,* 286 (1945). Trichlorethylene has been employed extensively for the relief of pain in trigeminal neuralgia since 1915, at which time Plessner made the first report on its use for this purpose. The first report of specific toxic responses to the drug was made in 1936 by Eichert, who observed severe psychotic manifestations in two cases.

The author reports a case in which the patient developed acute psychoses following excessive use of the drug for the relief of tic douloureux during one month prior to hospitalization for submission to neurosurgery.

On the first postoperative day the patient became so acutely maniacal that restraint and sedation were necessary. On the following day he was completely disoriented as to time, place and person;

he displayed some evidence of a mild paranoid trend. Following the administration of amytal sodium, dextrose in normal saline solution, insulin and vitamin B_1, the patient recovered rapidly, and was discharged as cured in two weeks.

It was determined that for a week prior to surgery the patient had used approximately sixty drops of trichlorethylene as frequently as twenty times daily. The upper limit of therapeutic dosage is stated to be sixty drops four times daily.

Toxic Effects of Diodoquin. D. N. Silverman and A. Leslie. *J. A. M. A. 128,* 1080 (1945). Previously published reports by other investigators do not indicate that any evidence of toxicity has been observed in the treatment of amebic dysentery with diodoquin (5,7-diiodo-8-hydroxyquinoline).

The authors report three cases in which the oral administration of the drug was followed by symptoms of toxicity. Examination of the stool of each of the patients revealed the presence of motile amebas in the first, the trophozoites of *Ameba histolytica* in the second, and amebic infection of the bowel in the third.

The first patient received daily a total of 2.4 gm. of diodoquin for nineteen days, during five of which he also received emetine hydrochloride intramuscularly. Shortly after this treatment was instituted he became asymptomatic, but within a few days a furuncle developed. Two months later a second course of diodoquin therapy was administered to this patient, with the same result. The substitution of carbarsone for diodoquin produced diarrhea.

Eight days of diodoquin therapy produced a severe, generalized and persistent furunculosis in the second patient, necessitating multiple incisions and drainage.

The third patient, after receiving diodoquin for twenty-three days, developed a blotchy erythema involving the entire body and also showed systemic reactions consisting of sore throat, chills and fever.

All in favor raise right hands . . . *with wallets*

Naturally we want our boys home.

But how much are we willing to do about it?

Are we willing to pay for bringing them back? If we are, we'll buy *extra* Bonds in the Victory Loan.

And after these fellows get home—what then?

We want to take care of the injured ones, of course. We want to give our boys a chance to finish their education. We want to see that there are plenty of decent jobs for them.

How much are we willing to do about that?

If we're really serious about wanting to see that our men get what they have so richly earned, we'll buy *extra* Bonds in the Victory Loan.

Now's the time. Let's have a show of hands—with wallets—to prove how much we really want to hear that familiar voice yelling "It's *me!*" Let's prove, with pocketbooks, that we can do our job as well as they did theirs.

THEY FINISHED THEIR JOB—
LET'S FINISH OURS!

VICTORY LOAN

American Journal of Pharmacy

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